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Experiments with cotton varieties in Louisiana, 1947-1950

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By

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W. G. TAGGART, Director

EXPERIMENTS WITH COTTON VARIETIES IN LOUISIANA, 1947-1950

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Part I

Cotton Variety Tests, 1947-1950

INTRODUCTION

The estimated* acre yield of lint in Louisiana fluctuates with weather conditions and the prevalence of insects, but the state average acre yield of lint in Louisiana has gradually increased for the past eighty years. The highest estimated acre yield of lint—392 pounds—was attained in 1948. Louisiana cotton farmers receive more money from cotton and cotton products than from any other crop in the state. It behooves each grower to choose his variety of cotton carefully and protect it from damaging insects during the growing season.

New varieties and strains are being developed continuously, and this summary of cotton variety experiments was prepared so that one can evaluate the long-time results from certain varieties. The preliminary mimeograph reports of the Crops and Soils Department from 1947 through 1950 give the detailed report on cotton variety and strain tests.

This report presents the average results from a number of varieties that have been tested at five experiment stations located in Louisiana. The data at the separate stations were combined and analyzed statistically so that variety behavior may be evaluated.

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* Montgomery, J. P., "Louisiana Cotton Statistics with Comparisons," Louisiana Experiment Station, Bulletin No. 439, 1949.

PROCEDURE

The yield of seed cotton is based upon the mean weight from six single-row plots at each location. Each plot was approximately 100 feet in length. Lint per cent is determined by ginning two 100-boll samples from each variety on a small roller gin.

The boll size, lint per cent, and staple length determinations were secured from these 100-boll samples. The fiber length determinations were made by Harvey B. Martin and his associates of the Production and Marketing Administration Cotton Classing Office at Alexandria, La.

The planting, cultivation, and harvesting of the cotton variety tests located throughout the state were conducted by C. B. Haddon, J. Y. Oakes, D. M. Johns, and R. S. Woodward at the respective stations. The Baton Rouge tests were conducted by F. W. Self, Jack E. Jones and John R. Cotton.

The seed used in these cotton variety tests were obtained from the following sources:

Acala 4-42—Grown in cooperation with the U. S. D. A. for spinning trials.
Acala 1517W—Grown in cooperation with the U. S. D. A. for spinning trials.
Bobshaw—Bobshaw Seed Company, Indianola, Miss.
Cobal T-416—U. S. Cotton Field Station, Knoxville, Tenn.
Coker 100 WR—Coker's Pedigreed Seed Co., Hartsville, S. C.
Coker 100 Staple—Coker's Pedigreed Seed Co., Hartsville, S. C.
CRI—Oklahoma Cotton Research Station, Chickasha, Okla.
Delta Smooth Leaf—Delta Branch Experiment Station, Stoneville, Miss.
Deltapine 14—Delta and Pine Land Co., Scott, Miss.
Deltapine 15—Delta and Pine Land Co., Scott, Miss.
Delfos 444—Northeast Louisiana Experiment Station, St. Joseph, La.
Delfos 651—Delta Branch Experiment Station, Stoneville, Miss.
Delfos 9169—Stoneville Pedigreed Seed Company, Stoneville, Miss.
Empire—Empire Pedigreed Seed Company, P. O. Box 7, Haralson, Ga.
Fox—Delta and Pine Land Company, Scott, Miss.
Louisiana 33—Louisiana Agricultural Experiment Station, Baton Rouge, La.
Louisiana 47—Louisiana Agricultural Experiment Station, Baton Rouge, La.
Louisiana 310—Louisiana Agricultural Experiment Station, Baton Rouge, La.
Mebane 6801—Oklahoma Cotton Research Station, Chickasha, Okla.
Miller 610—Mississippi State College, State College, Miss.
Miller 919—North Louisiana Experiment Station, Calhoun, La.
Marett's E-1-21-2-3-10—Marett's Farm and Seed Co., Westminister, S. C.
Paula—Deering Farm Incorporated, Deering, Mo.
Plains—Alabama Agricultural Experiment Station, Auburn, Ala.
Sealand 542—W. H. Jenkins, Pee Dee Experiment Station, Florence, S. C.
Stoneville 2B—Stoneville Pedigreed Seed Company, Stoneville, Miss.
Stoneville 2B-2492—Stoneville Pedigreed Seed Coempany, Stoneville, Miss.
Stoneville 5A—Stoneville Pedigreed Seed Company, Stoneville, Miss.
Stoneville 62—Oklahoma Agricultural Experiment Station, Stillwater, Okla.
Smith 78—McQueen Smith Farms, Prattville, Ala.
Stonewilt—W. W. Wannamaker, St. Mathews, S. C.
Tidewater x 45-210-515—Northeast Louisiana Experiment Station, St. Joseph, La.
Wilds—Coker's Pedigreed Seed Company, Hartsville, S. C.
White Gold Wilt—Marett's Farm and Seed Company, Westminister, S. C.
White Gold Strain 5—Marett's Farm and Seed Co., Westminister, S. C.
Watson's Mebane—Grown in cooperation with the U. S. D. A. for spinning trials.

Each test received the recommended fertilizer treatment and normal cultivation for good plant growth. Each year harmful cotton insects were present and control measures were required at each station. Frequent showers during June, July, and August many times minimize the effectiveness of insecticides as control measures. The growers who adequately protect their crops during these months can expect to have a fair return from their cotton crop. It was further noted that if normal or above normal rain fell during the months of July and August, the varieties tested frequently did not produce the highest acre yield of lint on the richer river bottom soils.

The mean yields of the varieties at each station have been summarized in Tables 1, 3, 5, 7 and 9. Tables 2, 4, 6, 8 and 10 present a summary of comparable mean lint yields of varieties that were not grown every year. The comparable yields* of these varieties are obtained as illustrated at the bottom of Tables 2, 4, 6, 8 and 10. The correction factors were obtained from the mean acre yields of the varieties that were grown in the period of years summary as shown at each station. This was done by substituting in the following equation:

$$\overline{X} - Xy = C$$

Where $\overline{X}$ is the grand average of varieties that have been grown every year in the period of years summary; Xy is the mean of the yth year, and C is the correction factor.

The correction factor for each year was then added, algebraically, to the yield values for all varieties within that year. This gives a set of estimated comparable yields, as shown in Tables 2, 4, 6, 8 and 10.

SOUTH LOUISIANA TESTS

F. W. Self, Jack E. Jones and John R. Cotton

Cotton Variety Averages of Tests, 1947-1950, Baton Rouge, La.

The tests at Baton Rouge were located on the Louisiana Experiment Station Perkins Road Farm three miles east of Baton Rouge, La. The soil type is Olivier silt loam. High rates of complete fertilizer were used in the tests each year. The tests received 500 pounds of 6-8-8 fertilizer, with 50 pounds of sodium nitrate as a side dressing, in 1947; 550 pounds of 6-8-8 fertilizer, with 150

* Patterson, R. E., "A Method of Adjusting for Calculating Comparable Yields in Variety Tests," Agronomy Journal, Volume 42: 509-511, 1950.

pounds of sodium nitrate as a side dressing, in 1948; 800 pounds of 6-8-8 fertilizer in 1949; 600 pounds of 6-8-8 fertilizer in 1950.

TABLE 1. Four-Year Averages of Cotton Varieties Tested on the Louisiana Experiment Station Perkins Road Farm, Baton Rouge, La., 1947-1950.

	Pounds of Lint Per Acre				4-Year Average			
	1947	1948	1949	1950	Lint per acre	Lint per cent	Staple length in 1/32″	Boll Size
Deltapine 15	393	539	342	648	481	40.0	34	85
Louisiana 33	506	541	356	470	468	37.4	33	83
Empire	461	534	279	586	465	37.2	34	70
Miller 610	397	414	359	645	454	37.7	32	76
Coker 100 WR	416	505	336	537	449	36.5	35	77
Smith 78	450	429	323	536	435	36.1	35	81
Stonewilt	446	487	261	537	435	36.7	34	81
Plains	457	421	254	601	433	37.5	34	76
Coker 100 Staple	416	484	336	478	429	35.3	35	83
Delfos 651	355	553	262	497	417	35.7	36	84
Stoneville 2B	408	431	268	518	406	35.8	35	73
Bobshaw	413	466	290	432	400	35.8	34	81
Mean lint per acre	427	484	306	540	439			
Difference for significance	78	94	58	77	44			

TABLE 2. Mean Yields By Years and Estimated Adjusted* Average Acre Yield of Lint of Cotton Varieties That Were Grown Less Than Four Years on the Louiisana Experiment Station Perkins Road Farm, Baton Rouge, La.

	Pounds of Lint per Acre						Average		
	1947	1948	1949	1950	Avg.	Adjusted Avg.	Lint per cent	Staple length in 1/32″	Boll size
Correction factors	+12	−45	+133	−101					
Fox	490	483	..	617	530	485	36.9	35	84
Mebane 6801	..			578	578	477	38.7	32	64
Deltapine 14	451	535	..	...	493	477	40.5	34	93
White Gold Wilt	..	...	328	588	458	474	36.2	34	76
Marett's E 1-21-2-3-10	..	..	373	538	456	472	35.7	35	68
Delfos 9169	427	518	339	..	428	461	36.1	35	78
Stoneville 62	459	463	...	..	461	445	38.5	32	87
Louisiana 310	424	496	..	...	460	444	38.8	32	83
Louisiana 47	456	443	314	..	404	438	38.1	32	85
White Gold Strain 5	..	..	279	516	398	414	35.1	35	71
Cobal T-416	410	444	...	..	427	411	36.7	34	82
Paula	409	463	463	...	445	400	35.3	35	78
Stoneville 5A	357	432	309		366	399	36.3	34	82
Delfos 444	...	360	314	471	382	377	31.8	36	93
C. R. I.	.. ...	..	..	460	460	359	37.2	34	68
Wilds	...	...	.	380	380	279	31.6	38	73
Sealand 542	...	199	242	284	242	237	31.4	42	82

* Estimated adjusted mean yields. The average acre yield of Fox, for example, was obtained as follows: (490 + 12) + (483 − 45) + (617 − 101) / 3= 485.

East Baton Rouge Parish receives annually, as an average, 59 inches of rainfall. Forty-five per cent of this total amount falls, as an average, during the months of April through August. For the five-month period, the Baton Rouge rainfall was 30.6 per cent below normal in 1947; 39.3 per cent below normal in 1948; 2.5 per cent below normal in 1949, and 1.46 per cent below normal in 1950.

The tests were planted on May 1 in 1947; April 28 in 1948; April 29 in 1949; and April 27 in 1950. Two plants per hill were spaced approximately 16 inches apart in the row.

The five varieties Deltapine 15, Louisiana 33, Empire, Miller 610, and Coker 100 WR were the highest yielding varieties, as an average, of the twelve in the four-year comparisons.

In certain years some of the varieties failed to rank in the high average, but they yielded better in other years, which held up their average yield of lint. These high producing varieties differ slightly in other characters, such as lint per cent, boll size, staple length, and resistance to Fusarium wilt.

In the group of varieties that were grown for a portion of the four years, the estimated adjusted mean yields of Delfos 9169, Fox, Deltapine 14, Stoneville 62, White Gold Wilt, Mebane 6801, and Marett's E-1-21-2-3-10 indicated that these varieties would have yielded as well as the five leading varieties if they had been grown during the same years. The estimated adjusted mean comparison was prepared for those who are interested in comparing the potential of certain varieties that were not grown in all the years. It may be noted that most of these varieties yielded approximately the same amount of lint per acre, particularly when one considers the over-all average acre yield of lint.

NORTHEAST LOUISIANA TESTS

C. B. Haddon, Superintendent

Cotton Variety Averages of Tests, 1947-1950, St. Joseph, La.

The tests at St. Joseph were conducted on the Northeast Louisiana Experiment Station approximately three miles north of St. Joseph, La. They were conducted on Commerce silt loam of dark brownish gray Mississippi river bottom soil. The cotton variety tests were rotated on land following soybeans. In 1947, 100 pounds of sodium nitrate per acre was applied before planting and after the cotton had been thinned to a stand; in 1948, 190 pounds of sodium nitrate per acre was used; in 1949, 200 pounds of sodium nitrate per acre was applied as a side dressing; in 1950, 145 pounds of ammonium nitrate per acre was applied to the test.

St. Joseph receives annually, as an average, 21.99 inches of rainfall during the five months of April through August. In 1947, the rainfall was approximately 12 per cent below normal; in 1948,

TABLE 3. Four-Year Averages of Cotton Varieties Tested on the Northeast Louisiana Experiment Station, St. Joseph, La., 1947-1950.

	Pounds of Lint Per Acre				4-Year Average			
	1947	1948	1949	1950	Lint per acre	Lint per cent	Staple length in 1/32"	Boll size
Deltapine 15	816	1177	681	1038	941	39.8	35	74
Delfos 9169	821	1226	589	1008	911	35.8	36	67
Stoneville 5A	762	1093	579	1029	866	36.0	35	71
Coker 100 WR	758	1170	612	903	861	35.7	35	68
Empire	751	1113	632	885	845	35.8	35	57
White Gold Wilt	809	1054	584	917	841	36.9	35	67
Coker 100 Staple	661	1143	531	1008	836	34.5	37	73
Bobshaw	758	1008	542	987	824	35.1	35	69
Stoneville 2B	774	926	629	934	816	35.5	36	66
Delfos 651	798	1202	604	651	814	35.2	37	72
Delfos 444	642	1082	633	833	798	31.6	38	77
Wilds	465	810	436	729	610	32.0	41	66
Mean lint per acre	734	1084	588	914	830			
Difference for significance	83	103	40	70	54			

TABLE 4. Mean Yields by Years and Estimated Adjusted* Average Acre Yield of Lint of Cotton Varieties That Were Grown Less Than Four Years on the Northeast Louisiana Experiment Station, St. Joseph, La.

	Pounds of Lint per Acre						Average		
	1947	1948	1949	1950	Avg.	Adjusted Avg.	Lint per cent	Staple length in 1/32"	Boll size
Correction factors	+96	−254	+242	−84					
Fox		1166		1041	1103	934	36.0	36	75
Deltapine 14	800	1206			1003	924	40.2	35	73
Plains				972	972	888	36.6	35	65
Louisiana 33		1129	631	913	891	859	36.0	35	73
White Gold Strain 5		1098	574	986	886	854	34.5	35	66
Paula			538	987	763	842	33.7	36	63
C. R. I.				921	921	837	38.1	34	55
Stoneville 62	702				702	798	38.0	34	68
Marett's E 1-21-2-3-10		1033		892	963	794	34.9	37	64
Mebane 6801				876	876	792	38.3	32	58
Tidewater x 45-210-515			459	708	584	663	32.3	41	72
Acala 4-42		981	322		652	646	37.3	36	59
Rowden 41B		760	513		637	631	34.9	34	55
Acala 1517-W		932	326		629	623	35.0	36	63
Sealand 542		785	432	564	594	559	31.0	44	63
Watson's Mebane		766	315		541	535	36.0	35	54

*Estimated adjusted mean yields. The average acre yield of Deltapine 14, for example, was obtained as follows: (800 + 96) + (1206 − 254) / 2 = 924.

28 per cent below normal; in 1949, 14.4 per cent below normal, but in 1950, it was approximately 40 per cent above normal for the five months.

The highest acre yields were produced when the area received 28 per cent below normal rainfall. The test, as an average, produced longer fiber when it received an excess of 40 per cent of its normal rainfall for the April through August period.

The tests were planted on April 28 in 1947; on April 29 in 1948; on April 26 in 1948; and on April 27 in 1950. Two plants per hill were spaced approximately 12 inches apart in the row.

Deltapine 15 and Delfos 9169 were the two highest yielding varieties, as an average, of the twelve varieties in the four-year comparison. Deltapine ranked first in 1949 and 1950, but second in 1947 and 1948. Delfos 9169 ranked first in 1947 and 1948, seventh in 1947, and tied Coker 100 Staple for second in 1950. The average over-all acre yield of lint for these two varieties shows that they do not differ significantly in their yielding ability.

In the group of varieties that were grown for a portion of this four-year period, the estimated mean adjusted yields of Fox, Deltapine 14, and Plains indicate that these varieties yielded relatively as well as the two that were high in the four-year comparisons.

In the long staple group, Tidewater x 45-210-515 and Wilds out-yielded Sealand. Sealand 542 produced the longest fiber of all varieties tested.

NORTHWEST LOUISIANA TESTS

J. Y. Oakes, Superintendent

Cotton Variety Averages of Tests, 1948-1950, Bossier City, La.

The tests at Bossier City were conducted on the Red River Valley Experiment Station approximately eight miles south of Bossier City, La. The soil type is Yahola very fine sandy loam Red River bottom soil. The tests received 50 pounds of nitrogen per acre in 1948; 40 pounds of nitrogen per acre in 1949; and 400 pounds of 6-8-8 fertilizer per acre in 1950.

The Bossier City area receives annually, as an average, 40 inches of rainfall. The area receives approximately 18.59 inches during the five months of April through August. The area received approximately 21 per cent below normal in 1948; 35 per cent below normal in 1949; and an excess of 40 per cent in 1950. The highest average acre yield and the longest fiber were produced when the area received the excess rainfall in the five-month period.

The tests were planted on May 5 in 1948; on April 25 in 1949; and on April 28 in 1950. Two plants per hill were spaced approximately 16 inches apart in the row.

TABLE 5. Three-Year Averages of Cotton Varieties Tested on the Red River Valley Experiment Station, Bossier City, La., 1948-1950.

	Pounds of Lint per Acre			3-Year Average			
	1948	1949	1950	Lint per acre	Lint per cent	Staple length in 1/32″	Boll size
Deltapine 15	724	717	890	777	39.6	35	76
Empire	836	698	724	753	35.2	35	66
Coker 100 Staple	732	637	882	750	34.9	36	77
Coker 100 WR	785	526	876	729	35.1	35	74
Plains	675	571	867	704	36.1	34	70
Bobshaw	549	507	933	663	34.8	34	75
Delfos 9169	631	558	785	658	34.2	36	71
Stonewilt	627	575	761	654	34.4	34	76
Louisiana 33	648	641	658	649	36.5	34	76
Stoneville 2B	696	473	760	643	34.9	35	72
Mean lint per acre	690	590	814	698			
Difference for significance	127	141	*	92			

* Differences not significant.

TABLE 6. Mean Yields by Years and Estimated Adjusted* Average Acre Yield of Lint of Cotton Varieties That Were Grown Less Than Three Years on the Red River Valley Experiment Station, Bossier City, La.

	Pounds of Lint per Acre					Average		
	1948	1949	1950	Avg.	Adjusted Avg.	Lint per cent	Staple length in 1/32″	Boll size
Correction factors	+8	+108	−116					
Delfos 651		696	908	802	798	36.0	38	70
Fox	759		892	826	772	36.5	35	82
White Gold Wilt		600	883	742	738	36.2	35	67
Stoneville 62	718			718	726	37.0	32	82
Miller 610	675		882	779	725	35.4	31	79
Louisiana 47	683	647		665	723	35.5	33	84
Delta Smooth Leaf		590		590	698	40.4	35	66
White Gold Strain 5		587	801	694	690	35.3	35	66
Delfos 444		622	759	691	687	31.6	38	85
Smith 78	635		790	713	659	35.5	35	75
Mebane 6801			750	750	642	40.0	33	63
C. R. I.			747	747	639	39.5	33	60
Deltapine 14	622			622	630	39.6	33	88
Paula			728	728	620	34.6	36	61
Stoneville 5A	589		747	668	614	37.5	34	80
Stoneville 2B-2492	596		576	586	532	34.9	35	66
Wilds			635	635	527	32.2	41	67
Tidewater x 45-210-515		270	582	426	422	32.9	41	71
Sealand 542	435		413	424	370	31.5	41	71

* Estimated adjusted mean yields. The average acre yield of Delfos 651, for example, was obtained as follows: (696 + 108) + (908 − 116) / 2 = 798.

Deltapine 15, Empire, Coker 100 Staple, Coker 100 WR, and Plains were the five highest yielding varieties, as an average, of the ten varieties in the three-year comparison. These five varieties varied some in their rank in certain years, but they produced relatively high acre yield of lint each year.

In the group of varieties that were grown for a portion of the three years, the estimated adjusted mean yields of Delfos 651 and Fox indicate that these two varieties yielded relatively as well as any of the five high producing varieties in the three-year comparison.

In the long staple group, Wilds out-yielded Tidewater x 45-210-515 and Sealand in the adjusted average comparison. They all produce 1 and 9/32 inches staple length.

NORTH LOUISIANA EXPERIMENT STATION TESTS

R. S. Woodward, Superintendent

Cotton Variety Averages of Tests, 1947, 1948, and 1950, Calhoun, La.

The tests at Calhoun were conducted on the North Louisiana Experiment Station at Calhoun, La. They were located on well-drained Orangeburg sandy texture type soil. This soil is highly productive in years of ample rainfall. The tests received 350 pounds of 4-8-8 fertilizer in 1947; 250 pounds of 5-10-5 fertilizer in 1948; and 450 pounds of 6-8-8 fertilizer in 1950.

The Calhoun area receives, as an average, 21.08 inches of rainfall during the months of April through August. In 1947, the station received approximately 11 per cent above normal rainfall; in 1948, 38 per cent below normal; and in 1950, approximately 52 per cent above normal rainfall during this period. The highest average acre yield of lint and the longest average staple length were produced when the test received the highest rainfall for this five-month period.

The tests were planted on April 26 in 1947; on April 21 in 1948; and on May 9 in 1950. Two plants per hill were spaced approximately 16 inches apart in the row.

The nine varieties in the three-year summary did not differ significantly in their mean yielding ability. In 1947, Louisiana 33, Smith 78, Stoneville 2B, Plains, and Stoneville 5A were the best yielding varieties. These varieties do not show this superiority when one compares the over-all mean yield of the nine varieties for three years at this station.

TABLE 7. Three-Year Averages of Cotton Varieties Tested on the North Louisiana Experiment Station, Calhoun, La., 1947, 1948, 1950.

	Pounds of Lint per Acre			3-Year Average			
	1947	1948	1950	Lint per acre	Lint per cent	Staple length in 1/32″	Boll size
Smith 78	224	490	659	458	35.7	33	85
Stoneville 2B	211	501	656	456	36.0	33	81
Louisiana 33	255	517	595	456	37.6	32	84
Empire	186	531	636	451	35.7	33	73
Deltapine 15	190	505	643	446	40.2	33	88
Plains	202	512	615	443	36.8	33	81
Stoneville 5A	196	496	613	435	35.2	33	81
Miller 610	159	545	582	429	36.6	32	75
Coker 100 WR	172	511	527	403	35.4	34	79
Mean lint per acre	199	512	614	442			

The variation within blocks, strains, and years was so great that no significance can be attached to the average difference of lint per acre for these nine varieties. However, a difference of 62 pounds of lint per acre between varieties in 1947 is barely significant.

TABLE 8. Mean Yields by Years and Estimated Adjusted* Average Acre Yield of Lint of Cotton Varieties That Were Grown Less Than Three Years on the North Louisiana Experiment Station, Calhoun, La.

	Pounds of Lint per Acre					Average		
	1947	1948	1950	Avg.	Adjusted Avg.	Lint per cent	Staple length in 1/32″	Boll size
Correction factors	+243	−70	−172					
Fox	...	535	636	586	464	36.1	35	79
Louisiana 47	226	517	...	372	458	36.5	31	95
Miller 919	203	511	...	357	444	37.5	30	76
Deltapine 14	199	...	...	199	442	42.9	32	96
Delfos 9169	194	...	620	407	442	37.1	34	77
Louisiana 310	185	524	...	355	441	37.4	30	91
Coker 100 Staple	163	...	621	392	427	35.0	34	83
Bobshaw	170	...	543	357	392	36.4	32	79
White Gold Wilt	140	...	535	338	373	36.8	32	80

* Estimated adjusted mean yields. The average acre yield of Fox, for example, was obtained as follows: $(535 - 70) + (636 - 172) / 2 = 464$.

NORTH LOUISIANA HILL FARM EXPERIMENT

STATION TESTS

D. M. Johns, Superintendent

Cotton Variety Averages of Tests, 1948-1950, Homer, La.

The tests at Homer were conducted on the North Louisiana Hill Farm Experiment Station approximately three miles south of Homer, La. The tests were located on well-drained Ruston type soil.

The tests received 900 pounds of 4-8-8 fertilizer, with 20 pounds of nitrogen as a side dressing, in 1948; 500 pounds of 8-8-8

fertilizer and 75 pounds of ammonium nitrate with 25 pounds of 50 per cent muriate of potash as a side dressing in 1949; 600 pounds of 8-8-8 fertilizer and 150 pounds of nitrate of soda per acre as a side dressing in 1950.

The Homer area receives, as an average, 21.55 inches of rainfall from April through August. The Minden weather station (the closest weather records) reported approximately 49 per cent deficiency in 1948; 8 per cent deficiency in 1949; and 29 per cent excess in 1950, during this five-month period.

The tests were planted on April 21 in 1948; on April 18 in 1949; and on May 15 in 1950. Two plants per hill were spaced 16 inches apart in the row.

TABLE 9. Three-Year Averages of Cotton Varieties Tested on the North Louisiana Hill Farm Experiment Station, Homer, La., 1948-1950.

	Pounds of Lint per Acre			3-Year Average			
	1948	1949	1950	Lint per acre	Lint per cent	Staple length in 1/32″	Boll size
Empire	368	810	301	493	39.2	33	71
Deltapine 15	302	774	297	458	40.8	33	87
Louisiana 33	335	768	231	445	38.1	32	88
Stoneville 2B	362	745	216	441	37.1	34	78
Stonewilt	343	633	299	425	38.0	33	83
Mean lint per acre	342	746	268	452			

The variability within blocks, strains, and years was so great that no significance can be attached to the above difference of lint per acre.

TABLE 10. Mean Yields by Years and Estimated Adjusted* Average Acre Yield of Lint of Cotton Varieties That Were Grown Less Than Three Years on the North Louisiana Hill Farm Experiment Station, Homer, La.

	Pounds of Lint Per Acre					Average		
	1948	1949	1950	Avg.	Adjusted Avg.	Lint per cent	Staple length in 1/32″	Boll size
Correction factors	+110	−294	+184					
Fox	...	...	336	336	520	40.6	34	84
Plains	...	745	314	530	475	40.1	34	70
Smith 78	300	813	...	557	465	35.4	34	83
Coker 100 WR	...	766	270	518	463	39.5	35	79
Bobshaw	...	789	245	517	462	37.5	34	76
Miller 610	324	...	303	314	461	39.0	31	83
White Gold Strain 5	...	761	253	507	452	38.6	33	74
White Gold Wilt	...	708	436	572	436	38.8	33	81
Coker 100 Staple	...	666	310	488	433	38.7	37	77
Deltapine 14	312	...	...	312	422	38.5	32	107
Delfos 651	...	653	275	464	409	38.2	36	81
Stoneville 5A	358	635	...	497	405	36.4	33	88

* Estimated adjusted mean yields. The average acre yield of Plains, for example, was obtained as follows: (745 − 294) + (314 + 184) / 2 = 475.

The five varieties in the three-year averages did not differ significantly in their mean yielding ability. The difference between any of the over-all means of the five varieties was small, but Empire yielded relatively more than any of the other five varieties.

SUMMARY

A summary of the over-all performance of four cotton varieties that have been grown for four years at Baton Rouge and St. Joseph and for three years at Bossier City showed them as ranking in the following order: Deltapine 15, Coker 100 Staple, Empire, and Coker 100 WR. Deltapine 15 was the leading variety at three stations, but the other three varieties varied in their relative rank at the separate stations. The leading varieties at Baton Rouge in four years of testing were Deltapine 15, Louisiana 33, Empire, Miller 610, and Coker 100 WR. The leading varieties at St. Joseph in four years of testing were Deltapine 15 and Delfos 9169. These two varieties averaged over 900 pounds of lint per acre. In three years of testing, Deltapine 15, Empire, Coker 100 Staple, Coker 100 WR, and Plains were the five leading varieties at Bossier City. These five varieties averaged over 700 pounds of lint per acre. An average of the long staple variety data at St. Joseph and Bossier City showed that Wilds produced an over-all average of 569 pounds of lint per acre with a staple length of 1⅝ inches. Tidewater x 45-210-515 produced an average of 543 pounds of lint per acre and 1-9/32 inches staple length. Sealand produced 484 pounds of lint per acre and 1 11/32 inches staple length. Sealand made its highest yields and produced the longest fiber at the St. Joseph station.

From the average yields for the three years of testing at the North Louisiana Experiment Station and the North Louisiana Hill Farm Experiment Station at Homer, significant differences among the varieties tested at these stations were not found.

Part II
Louisiana Certified Cotton Seed Study

The question frequently arises as to whether cotton seed that has been grown and certified in Louisiana is equal to breeder's or to certified seed from adjoining states.

The 1948 tests contained five sources of seed, while the 1949 tests contained nine sources of seed. Eight of the nine entries in the 1949 tests were secured from Louisiana certified seed growers. The check was breeder's seed from the same variety. These tests were located at the Northeast Louisiana Experiment Station at St. Joseph and at the Red River Valley Experiment Station at Bossier City, La.

The Mississippi Experiment Station* has conducted extensive tests with five commercial cotton varieties and certified seed from the same varieties. These Mississippi experiments showed a small decrease in lint per cent as the years of reproduction increased. Other changes were less marked, but the number of naked seeds increased after the third generation of reproduction. Changes in seed cotton yields, lint yields, and staple length were too small and subject to too many factors to be properly evaluated.

The results of the Mississippi tests support the existing belief that the chief cause of cotton varietal deterioration is the mixing of varieties in fields, in places of storage, or at the gins.

The germination quality of seed is affected by many factors, such as weather damage in the field before the cotton has been harvested. This reduction in germination and vigor varies from season to season. A comparative experiment of breeder's seed with certified seed would be influenced by localized conditions under which the seed had been produced the previous year. The genetic variation in present day improved cotton varieties is small, and this difference is difficult to measure in field experiments. The variation in germination quality and vigor of cotton seed is frequently of a localized nature. Adverse climatic conditions in the field before the cotton seed was harvested may influence the experiment more than genetic variation. Because of their inability to compete with healthy plants, the weakened plants produce less cotton than thrifty plants of similar genetic purity. The normal germination per cent is not a measure of the vigor of the seed but a measure of the total number of seed that germinate under favorable environment. All of the cotton seed samples placed in these 1948 and 1949 experiments had 80 per cent or better germination. It was assumed that breeder's seed and certified seed vigor was on an equal basis, as excellent stands and growth were secured from each entry in the experiments.

The five lots of seed were mixed thoroughly, divided, and planted in single-row, randomized plots of four replications in 1948 at the two locations. These tests received normal attention, and seed cotton was harvested from each replicated plot to determine the yield of cotton per acre. Lint per cent for each source of seed was determined by ginning ten samples of ten bolls from each plot at Bossier City. Lint samples from the St. Joseph test were not collected in 1948.

The average of these two 1948 comparative experiments indicates that first- and second-year certified seed yielded equally as well as breeder's seed.

* O'Kelley, J. F. Degeneration Within Cotton Varieties. Journal American Society of Agronomy. 34:782-796. September 1942.

TABLE 11. Relative Yielding Values of Breeder's Seed, Mississippi Certified, and Louisiana Certified of Deltapine 15 Cotton Seed Tested on the Red River Valley Experiment Station, Bossier City, La., 1948.

	Pounds of Seed Cotton per Acre	Pounds of Lint Per Acre	Lint Per Cent	Staple length in 1/32"
Breeder's seed	1806	717	39.7	34
First-year Mississippi certified seed	1473	548	37.2	35
Second-year Mississippi certified seed	1774	699	39.4	34
First-year Louisiana certified seed	1840	734	39.9	34
Second-year Louisiana certified seed	1940	743	38.3	35

The seed from different sources did not differ significantly from breeder's seed in yield of lint per acre, lint per cent, or staple length.

TABLE 12. Relative Yielding Values of Breeder's Seed, Mississippi Certified, and Louisiana Certified of Deltapine 15 Cotton Seed Tested on the Northeast Louisiana Experiment Station, St. Joseph, La., 1948.

	Pounds of Seed Cotton per Acre
Breeder's seed	2977
First-year Mississippi certified seed	3059
Second-year Mississippi certified seed	2935
First-year Louisiana certified seed	3061
Second-year Louisiana certified seed	3151

The 1949 experiments in which breeder's seed were compared with eight samples from Louisiana first-year certified cotton seed gave the same comparative relationship as the 1948 experiments, i. e., there were no significant differences between breeder's seed and these eight first-year Louisiana certified Deltapine 15 samples.

These experiments were of a preliminary nature and the conclusions that can be drawn are limited. The changes that take place in first- and second-year certified seed of improved cotton varieties that are being used today are so small that cotton growers do not necessarily need to replace their seed stocks with breeder's seed until they have certified their seed two years. The storing, ginning, delinting, and treating of cotton requires special care to avoid mechanical mixtures. These preliminary tests show that certified seed growers who meet the requirements of the certifying agency can produce first- and second-year certified seed with yielding ability equal to that of breeder's seed of the same variety. A sample of seed that has been subjected to heavy weather damage which causes a low germination, obviously, would not be equal in value to one that had a high germination, whether it be breeder's seed or certified seed.